Threat Modeling & Analysis Program (TMAP)

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This briefing is UNCLASSIFIED

Need: Issues facing the Intelligence Community

- Customer demanding higher fidelity & greater degree of integration from IC
  - Current knowledge base & tools inadequate
- Address multitude of M&S customer requirements each with specific needs and formats
  - Traditional dissemination means inadequate
- Threat validation process costly/inefficient

Fundamental change to the knowledge base and tools is needed to modernize intelligence production

TMAP Overview

- Joint DIA, Intelligence Production Center Initiative (Service Intelligence Staffs involved)
- Common approach to modernize S&TI and databases
- Based on low risk COTS technology
- Back to engineering basics
- Approach promotes commonality, but retains flexibility necessary to meet organization specific requirements

Intel Production Today

Centers develop threat assessments through ALL-SOURCE analysis

ENGINEERING ANALYSIS

THREAT DATABASES
- •CHARACTERISTICS
- •PERFORMANCE
- •VULNERABILITIES

(WORDS, PARAMETRIC DATA, ENGINEERING EQUATIONS)

***NO* Model Included with Data Base**

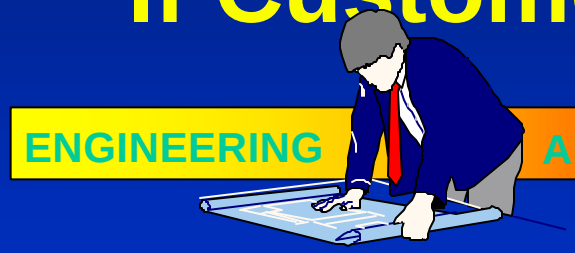
Multi-INTs

REQUIREMENTS

CUSTOMER

***So*, how are Models Created?**

If Customers build models...

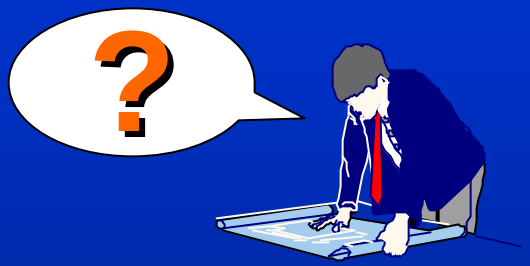


CHARACTERISTIC
PERFORMANCE
VULNERABILITIES

CUSTOMER A

CUSTOMER B

CUSTOMER C

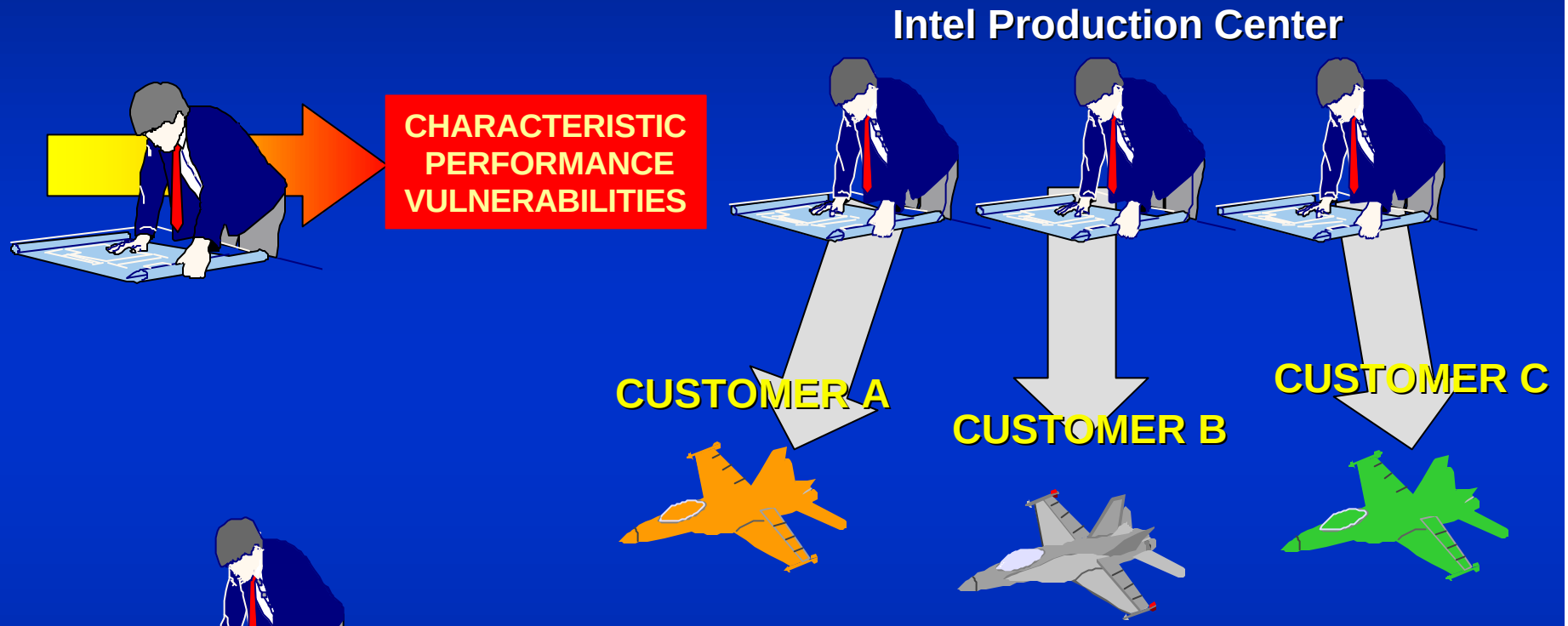


Production Center
Validation Process

Models NOT Reusable, NOT Maintainable
Customers become Intel Analysts

DoD 5000.2R requires validation
(CUSTOMER PAYS)

If Customers pay Center...



Models NOT Reusable, NOT Maintainable

DoD 5000.2R requires validation
(CUSTOMER PAYS)

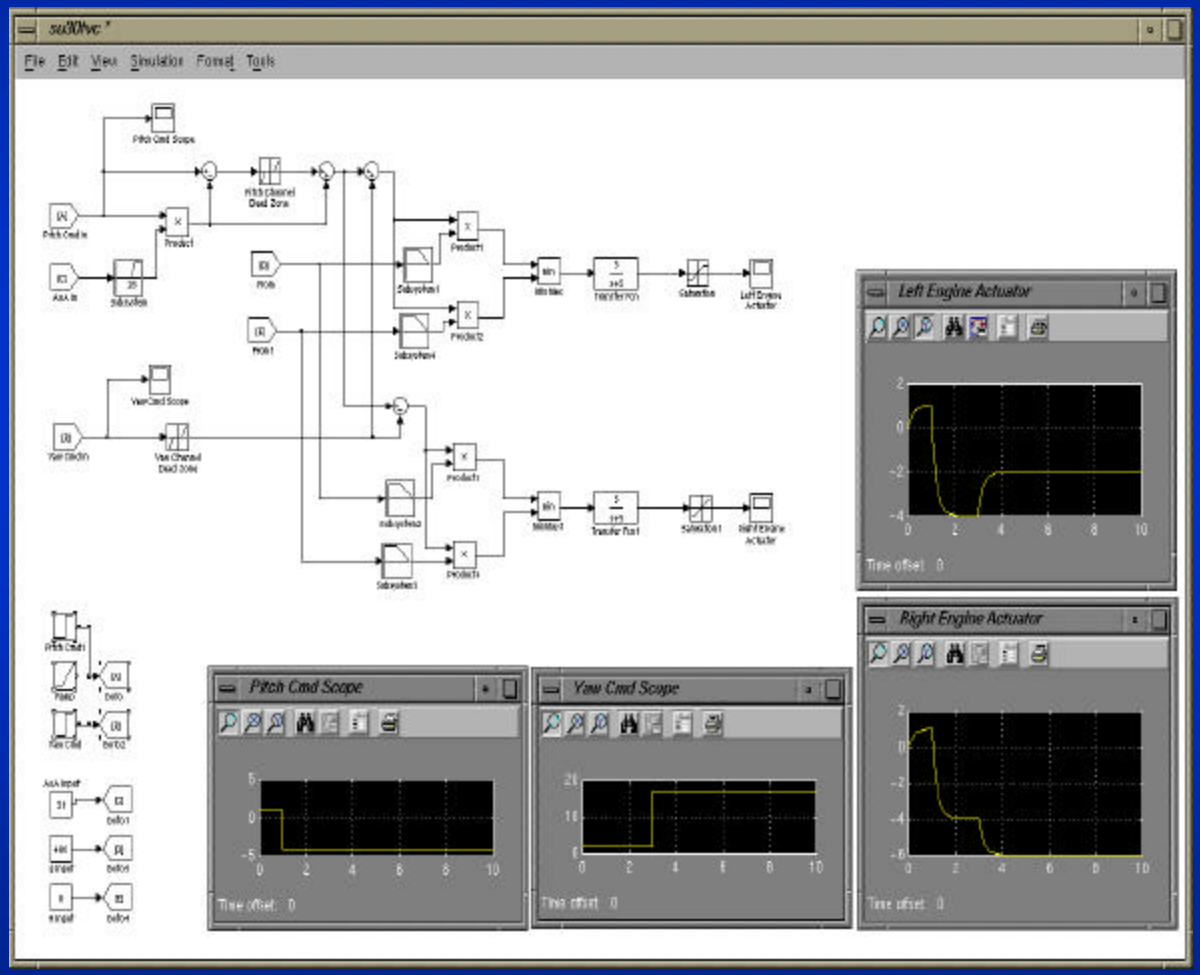
A Question

"At angles of attack greater than 30 degrees, output of Amp 6 is zero and the noz-zles diverge proportionally to the pitch control signal from the nonliner corrector whose signal appears at the output of summing Amp 8. This signal, which is passed to the adders, corresponds to the deflection of the nozzle to create a pitching moment."

Extract from 6 pages of text describing thrust vector control circuitry.

Would an operator who wants to build a model for a end-user application rather have this textual description of how the thrust vectoring system works as an intelligence product …….

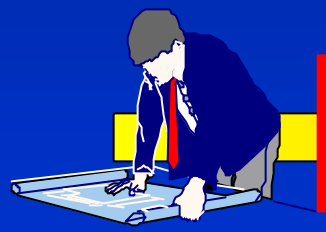
A Question



…… or this integrated digital threat representation that quantifies the entire control system to include inputs and outputs?

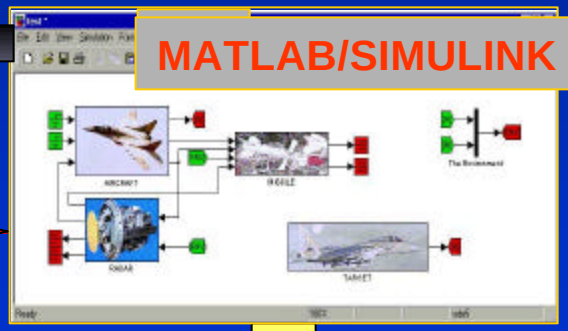
(which intel will maintain!)

Strategy



CHARACTERISTIC
PERFORMANCE
VULNERABILITIES

MATLAB/SIMULINK



Intel Funded

TMAP

Reusable, Maintainable, Validated
Engineering Representation

Multi-INTs

CENTER
DISCOVERY
PROCESS

Customer Saves $$

F-22
JSF
CVX
DD-21

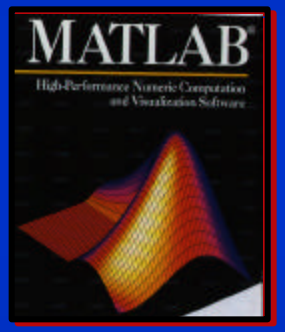
Production Center
Validation Process

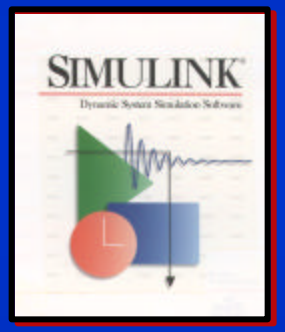
CUSTOMER
Adapts for Unique Applications

Customer Pays

Engineering Tools of Choice

- Commercially available software





Products of: The MathWorks

- Intuitive for system design & analysis
- Academic & industry standard tools

Goal: Change the Intel Analysis Process

- Build interoperable, reusable ***engineering*** threat representations for use by Intel and DoD M&S customers
  - Dynamic, Interactive Data Base
- Supports JMASS and other architectures
  - Acquisition, OT&E, few-on-few training

Why use Mathworks Tools

- Core tool of many engineering schools
- Wide use throughout industry
- Used by many defense contractors
- Successfully used in FME programs
- Directly extensible to M&S needs
- Platform independence
  - SGI, SUN, PC (LINUX, NT)
- Seamless Microsoft Office integration
  - Powerpoint, Word, Excel

A Good Idea Applied Across DIA and IPCs

- **Threat Modeling & Analysis Program (TMAP)**
  - All centers working to adopt new process
  - Modernizes intel analysis & production
  - Extensible for M&S needs
- **Hard work & commitment remains to realize the full TMAP vision**
  - Popular among centers and our customers
  - Strong advocacy from senior DoD officials

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Programmatics

- TMAP strongly advocated by DIA/DR
- Concept briefed to and approved by the Military Intelligence Board - June 2000
- Intelligence Program Decision Memorandum directed FY02 funding - September 2000
- Working to establish continuous intel funding for FY03 and beyond

Next Steps: FY02

- **Start up**
  - Procure initial set of COTS licenses
  - Begin analyst training
- **Determine/document Intelligence Community (IC) TMAP requirements**
  - For internal analytic/production modernization
  - For support to DoD customers
- **Develop initial weapon system templates**
- **Pilot project tasks**
  - Database interconnectivity
  - Multiple Production Center interoperability
  - TMAP to customers

Next Steps: FY03-07

- Continue license purchases and training until TMAP fully integrated into workforce
- Develop templates for all major classes of weapon systems
- Routinely use templates to meet Production Requests
- Develop appropriate connectivity to DIA's major databases
- Develop/document robust TMAP/Customer process
  - Including validation
  - Including documentation

Caveats

- Production schedule for specific models not yet established
- TMAP is NOT an architecture
- TMAP is NOT a simulation system
- TMAP is intended to supplement current DIA products
- COTS is not a panacea for every M&S problem
- Much hard work still required to achieve TMAP vision

Caveats

- Intel funding for FY03 and beyond has not yet been established
- Much of the overall effort will be directed at improving internal IC processes
- TMAP will only provide a core set of threat models at a given level of fidelity
  - Development of capabilities beyond the core will require negotiation and may require external resources
  - Extent of “core capabilities” not yet defined

Summary

- Viable technical solution
- Working level buy-in (across the Intelligence Community)
- Management buy-in (across the Intelligence Community)
- Some resource challenges remain

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